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THE HOLOTHURIANS OF CLIPPERTON ISLAND IN THE EASTERN TROPICAL PACIFIC

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In 1902 H. L. Clark listed two typical Indo-West-Pacific aspidochirote holothurians from Clipperton Island, though at that time he considered one of them a new species. Later expeditions brought no holothurian material from this island. It was not until 1958 that Deichmann was able to include in her Hancock report some material of a third species, collected by the Scripps Institution's expedition a few years before. Finally, in 1958, the University of California Clipperton Expedition, which used more refined methods, with diving, etc., brought back four species, two of which had never been reported from any locality in the eastern tropical Pacific.

Of the five species now known from Clipperton Island, only one, *Microthele difficilis* (Semper) appears to be well established on the mainland of the Pacific coast of America. Two other species had previously been listed from some of the outlying islands, *Semperothuria atra* (Jaeger) and *Mertensiothuria leucospilota* (Brandt). Of the remaining two forms, *Stichopus horrens* Selenka represents a typical Hawaiian form, while *Semperothuria flavomaculata* (Semper) is considered rare; it was originally described from Samoa and later listed from Tahiti, and (?) Batavia in the East Indies.

The conclusions one can draw from this short list are that more Indo-West-Pacific forms are able to cross, at least intermittently, the "Ekman Barrier" than hitherto assumed, and that some of these forms may have escaped notice because they are living at a greater depth here than that in which they normally live in the more favorable localities of the Indo-West-Pacific.

STICHOPODIDAE

1. STICHOPUS HORRENS (Selenka) 1867

Stichopus horrens Selenka, 1867, p. 316, pl. 18, figs. 27-29. H. L. Clark, 1922, p. 64, pl. 2, figs. 19-23.

Stichopus godeffroyi Semper, 1868, p. 75, pl. 130, fig. 4; var. *pygmaeus*, p. 75, var. b, p. 246.

Stichopus tropicalis Fisher, 1907, p. 676, pl. 70, figs. 1-11.

The five specimens secured measure 15-20 cm. in length and agree well with Fisher's description of his material from Hawaii. All the specimens have numerous C-shaped bodies of all sizes in the skin; this is the character which is supposed to separate *tropicalis* (= Semper's var. b.) from the typical *godeffroyi*, but I fully agree with H. L. Clark in regarding the presence or absence of these structures as most unimportant. The typical tables—with a pointed spire—are present, although not in large numbers in some individuals, and likewise the peculiar rosettes could be located in all five individuals.

The color of four of the specimens is indicated to be "mottled with orange and pale cream," while the fifth is "mottled dull greenish," a color range which agrees well with H. L. Clark's observations on *horrens*. Fisher writes: "dark olive green, mottled with deep brownish green." His material, 16 cm. long, in preserved condition, came from tide pools in Hawaii.

While most earlier records (from Samoa, Fiji and Hawaii) are from shallow water, the present material (Clipperton A-588-6) came from 10-20 meters depth, off the edge of "the 10 fathoms terrace" on the northern side of the atoll: it was noted that the species did not occur at greater depth (40 meters) off the edge of that terrace. It was also observed, at similar depth, on the other side of the island, and the species appears therefore to be well established in this locality.

HOLOTHURIIDAE

2. MICROTHELE DIFFICILIS (Semper)

Holothuria difficilis Semper, 1868, p. 92, pl. 30, fig. 21.

Microthele difficilis:—Deichmann, 1958, p. 288, pl. 1, figs. 6-9 (list of references).

Four dark brown individuals, 6-7 cm. long, were collected (Clipperton A-588-8) on the reef flats "from the shore out, at least to the weak algal ridge."

The presence of this species in Clipperton is not surprising, since this atoll was the type locality for H. L. Clark's "*Holothuria frequentiamensis*," described in 1902 on the basis of 17 individuals, about 4 cm. long, of which one had immature genital organs.

The species ranges from the east coast of Africa to the Panamic region, where it is known from the Galapagos Islands, northwards to Espiritu Santos Island in the Gulf of California.

3. SEMPEROTHURIA FLAVOMACULATA (Semper)

Holothuria flavomaculata Semper, 1868, pp. 87, 277, pl. 30, fig. 26. Panning, 1934, pt. II, p. 42, text-fig. 35 (list of references).

Semperothuria flavomaculata:—Deichmann 1958, p. 303 (treated in the key for the genus).

Until the present study, there were only a few species belonging to the old genus *Holothuria* of which the Museum of Comparative Zoology did not possess representatives, and *flavomaculata* was one of these. When the key for the few members of the genus *Semperothuria* was worked out in 1958, it was necessary to rely entirely on the literature. It was consequently a satisfaction to discover two specimens of this comparatively rare species in the Clipperton material and to find that they agreed with the key.

Both specimens came from Clipperton A-588-6, from the 10 fathoms terrace, in water varying from 1-20 meters, off the edge of the tidal flat. The species was not noted by divers off the edge of that terrace, in water up to 40 meters depth.

The two individuals (M.C.Z. no. 3008) measure 8 and 12 cm. in length; they are dark, with few feet in scattered rows on the ventrum and more sparingly developed as papillae on the dorsum, here with a yellow area around their base. The spicules agree completely with the earlier descriptions: a crowded layer of tables with no disk, but a base which tapers to a point, four pillars and the spire ending in a double Maltese cross. In the deeper layer are scattered short rods, covered by coarse, rough spines, or clusters of spines.

The type, 11 cm. long, came from Samoa, and according to Panning the species has also been taken in Tahiti and (?) Batavia. It may possibly, when contracted, have been mistaken for *Ludwigothuria atra*, or some of the other dark-skinned forms in the Indo-Pacific. It was at first assumed that the material

represented *atra*, previously known from Clipperton Island, but the roughness of the skin eliminated that possibility, even before the spicules had been examined.

4. MERTENSIOTHURIA LEUCOSPILOTA (Brandt)

Stichopus leucospilota Brandt, 1835, p. 51.

Mertensiothuria leucospilota:—Deichmann, 1958, p. 297, pl. 3, figs. 1-9 (list of references).

Three large, reddish-brown individuals (Clipperton A-588-8) were collected on reef flats, identical in size and spiculation with those taken some years ago by the Scripps Clipperton Expedition, and included in Deichmann's 1958 report.

The species has the same wide range as *Microthela difficilis*, from the east coast of Africa to the Panamie region, but so far it has never been found established on the mainland. The Hancock expeditions reported it from Galapagos, Clarion and Socorro islands. The largest individuals, 20 cm. long, in preserved condition, have all come from Clipperton Island.

5. LUDWIGOTHURIA ATRA (Jaeger)

Holothuria atra Jaeger, 1833, p. 22. Panning, 1934, pt. II, p. 30, text-fig. 22 (list of literature).

Ludwigothuria atra:—Deichmann, 1958, p. 312, pl. 2, figs. 18-23.

Of this species H. L. Clark reported nine specimens from Clipperton Island in 1902. The Hancock expeditions collected thirteen in the Galapagos Islands and one in Cocos Island. The species is known to range from Mozambique to Hawaii; in the latter locality it is stated by Fisher to be "one of the commonest holothurians inhabiting Hawaiian shores."

The fact that the recent expeditions to Clipperton Island did not collect this large and conspicuous species, in spite of the intensive collecting undertaken, may indicate that this is one of the species which only intermittently crosses the "Ekman Barrier" but is unable to become permanently established in the less favorable localities which it finds in the eastern Pacific.

REFERENCES

BRANDT, J. F.

1835. Echinodermata ordo Holothurina. *In* Prodrömus descriptionis animalium. . . . Petropoli, Fasc. 1, pp. 242-262.

CLARK, H. L.

1902. Papers from the Hopkins Stanford Galapagos Expedition. Vol. 4, art. 12, Echinodermata. Proc. Washington Acad. Science, vol. 4, pp. 521-531.
1922. The holothurians of the genus *Stichopus*. Bull. Mus. Comp. Zool., vol. 65, no. 3, pp. 39-74, pls. 1-2.

DEICHMANN, E.

1958. The Holothurioidea collected by the Velero III and IV during the years 1932 to 1954. Part II. Aspidochirota. Allan Hancock Pacific Expeditions, vol. 11, no. 2, pp. 251-346, pls. 1-9. (Contains a number of new generic names for various members of the old genus *Holothuria*.)

FISHER, W. K.

1907. The holothurians of the Hawaiian Islands. Proc. U. S. National Museum, vol. 32, pp. 637-744, pls. 66-82.

JAEGER, G. F.

1833. De Holothuriis. Diss. Inaug. Turici (Torino, Italia), 40 pp., 3 pls.

PANNING, A.

1928. Die Gattung *Holothuria*. Parts I-V. Mitt. Staats Inst. und Zool. Museum Hamburg, vol. 44, pp. 91-138, 21 text-figs., 1 chart; vol. 45, pp. 24-50, 26 text-figs., 3 charts; *ibid.*, pp. 65-84, 27 text-figs.; *ibid.*, pp. 85-107, 32 text-figs.; vol. 46, pp. 1-18, 19 text-figs., and index to all five parts.

SELENKA, E.

1867. Beiträge zur Anatomie und Systematik der Holothurien. Zeitschrift Wiss. Zool., vol. 17, pp. 291-374, pls. 17-20.

SEMPER, C.

1868. Reisen im Archipel der Philippinen, II. Wissenschaftliche Resultate, vol. 1, Holothurien, 299 pp., 10 pls.